Respiratory Use and Practices (2000–Present): Results of the BLS/NIOSH Survey, Focus Groups, and Worksite Observations and Interventions

Mark Greskevitch,[1] Brent Doney,[1] Dennis Groce,[2] Girija Syamlal,[1] Ki Moon Bang[1]

[1]National Institute for Occupational Safety and Health (NIOSH), Morgantown, WV; [2]Federal Occupational Health, Chicago, IL

Purpose

To determine if respirators are used under the guidance of a NIOSH-recommended respiratory protection program (RPP), and to determine barriers to using respirators under a RPP.

Objective

To identify well-developed RPP features that could be leveraged to improve respirator use in all private sector industries.

Methods

In 2001, the Bureau of Labor Statistics (BLS) and NIOSH collected national data on respirator use and practices for private sector industries.[1]

During 2000–2004, NIOSH investigators conducted focus groups in the coatings/painting, demolition, and road transportation building sectors of the construction industry to learn about respirator program characteristics.[2]

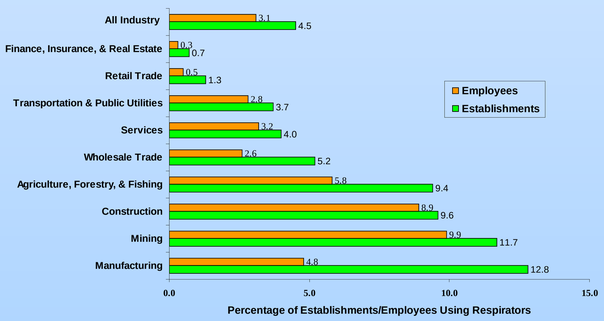
During 2006–2007, NIOSH investigators observed RPP at road construction and demolition sites and began developing potential interventions to improve RPP, based on those observations and literature searches.

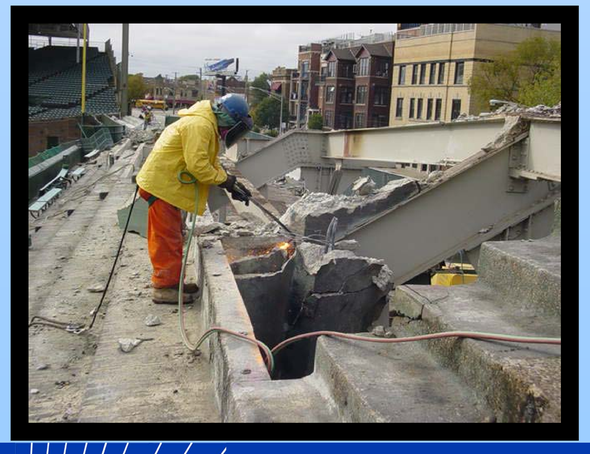
In 2007, NIOSH investigators commenced suggesting interventions to improve RPP at road construction sites involving small companies (10 to 150 workers). Successful interventions may be disseminated on a broad scale to appropriate employers.

BLS/NIOSH Survey

The 2001 BLS/NIOSH survey findings:

Percent of Establishments and Employees that Used Respirators for Required Purposes in the 12 Months Prior to the Survey, by Major Industry Division





BLS/NIOSH Survey cont'd

Indicators of potentially inadequate RPP:

Respirator Selection

At most, 30% of all respirator-using establishments selected respirators based on air sampling.

Program Administrator

42% of program administrators at respirator-using establishments had no specific respirator training.

- With a trained administrator - 70% of establishments had a required written procedure for cleaning respirators
- Without a trained administrator - 23% of establishments had a required written procedure for cleaning respirators

Employee Respirator Training

40% of respirator-using establishments failed to provide required respirator training to their employees.

Assessment of Medical Fitness to Wear a Respirator

46% of respirator-using establishments did not assess employees for medical fitness to wear a respirator.

Fit-testing

26% of establishments using tight-fitting respirators either did not provide required fit-testing, didn't know it was needed, or did not know if they had provided it.

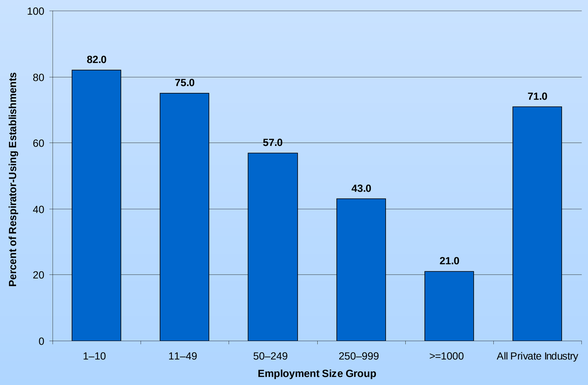
Air-purifying Respirator Change-out Schedule

Only 18% of establishments using air-purifying respirators with gas/vapor filters had a required written change-out schedule.

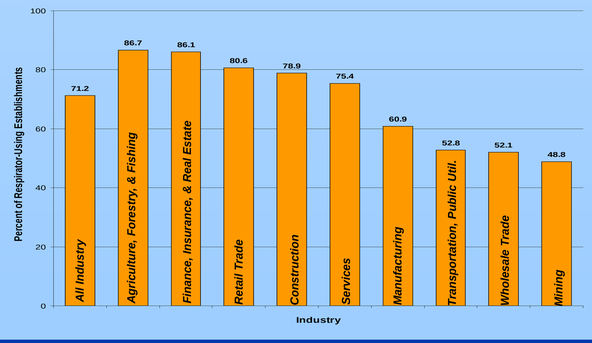
Airline Respirator Hose Coupling Compatibility

18% of all airline respirator-using establishments and 40% of the mining airline respirator-using establishments did not employ respirator hose couplings that were incompatible with other air or gas supply lines.

Percent of Respirator-Using Establishments with 3 or More Indicators of Potentially Inadequate Respirator Programs by Employment Size Group



Percent of Respirator-Using Establishments with 3 or More Indicators of Potentially Inadequate Respirator Programs by Industry



Focus Groups

Factors that prevent effective RPP:

Respirator Use/Design-related Factors

- Lack of comfort at high temperature (i.e., sweating, heat stress, rash)
- Lack of comfort
- Fogging of full facepiece respirators
- Other head/face PPE interferes with respirators
- Increasing airflow resistance (especially when wet)
- Insufficient indicators for cartridge chemical saturation
- Visual obstruction due to respirator (hoods and full facepieces)
- Speaking diaphragms of respirators make communications difficult to hear

Industry/Worksite-related Factors

- High worker turnover
- Short duration of jobs adversely impacts:
  - Workers' training
  - Fit-testing
  - Air monitoring
  - Medical evaluation
- Lack of storage and cleaning facilities

Management-related Factors

- Cost of respirator programs seen as too high (including respirator, filter, training and medical evaluation)
- Difficulties in enforcing proper respirator use

Worker-related Factors

- Language barrier for non-English speakers
- Unawareness of respirator importance
- Management-perceived lack of worker commitment
- Low educational level of some workers
- Presence of facial hair

The focus groups indicated that the quality of RPP differed markedly within the construction industry.

Follow-up Observations

Demolition Observations

The follow-up worksite observations indicated that the demolition industry is faced with strict regulations for a wide variety of airborne hazards (including EPA and OSHA lead regulations), and that the industry has responded with comprehensive programs of hazard control, including proper RPPs. These effective RPPs could be adapted for use in other industries.

Features of RPPs in Demolition

- Clear company priority for safety and health
- Frequent safety meetings at the job site – sometimes daily
- Clearly identify specific circumstances requiring respiratory protection
- Safe, clean area for storing respirators
- Ready availability of replacement respirator bodies and filters
- Management clearly expresses policies supporting use of respirators

Observations in Road Construction

The follow-up worksite observations indicated that the road construction industry is also faced with a wide variety of airborne hazards, and that many companies (both small and large) have not developed comprehensive programs of hazard control, including proper RPPs.

Update: Interventions

- RPP observations/interventions have continued at road construction sites
  - To date, twelve sites have participated: three painting, one concrete grinding, one crushing, one drilling, two asphalt pavement, and four saw-cutting operations – since March 2009 new site visits in Iowa/Colorado
  - Recruiting participants continues to be difficult: new sites have been identified in West Virginia and Pennsylvania and contacts are working on new sites in Colorado and Vermont
- New publications:
  - Improving Respiratory Protection Programs In Healthcare To Reduce/Control Infection - Infection Control Today Magazine;
  - Respirator Use and Practices in Instruments Manufacturing Establishments - Instrumentation Science & Technology Magazine;
  - Respirator Use Among ARTBA Member Companies - National Work Zone Safety Information Clearinghouse;
  - Respirator Use and Practices in Food and Kindred Products Manufacturing Establishments (White Paper) - foodprocessing.com;
  - Respiratory Protection Is Your Program Effective? Professional Safety Magazine
- Effective RPP interventions will be considered for dissemination to a larger number of construction establishments and in other industries

Limitations

- Selection of focus group and site visit participants (volunteers from members of National Demolition Association, ARTBA, and other companies agreeing to participation) was non-random
- Focus group and observational site data may not be representative of the demolition and road construction industries

Conclusions

- Inadequacies in respiratory protection programs are potentially widespread
- Some industries have developed effective respiratory protection programs
- A trained, involved RP administrator is vital to an effective RPP
- Few government programs address road construction worker health issues (relative to overall funding for road construction)

References

1. Bureau of Labor Statistics (BLS)/National Institute for Occupational Safety and Health (NIOSH): *Respirator Usage in Private Sector Firms, 2001.* Washington, DC: USDOL, BLS, 2003.

2. National Institute for Occupational Safety and Health (NIOSH): *Respirator Use and Practices by National Demolition Association Member Companies.* B Doney, M Greskevitch, D Groce (poster at 2006 American Industrial Hygiene Conference and Exhibition).

Disclaimer: The findings and conclusions in this poster are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

Contact : Mark Greskevitch: mfg1@cdc.gov (304) 285-6305
NIOSH, 1095 Willowdale Road, Morgantown, WV 26505

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